What is the Web?

The Web is an internationally networked information system that presents text including databases and high resolution images, sound, and video on all aspects of knowledge. The effect is like an ever-growing multimedia encyclopedia that is being created interactively and cooperatively by the users.

The World Wide Web is also:

- A highly visible place to define who we are, what we have, and what we do to a rapidly growing audience currently estimated to be over 10+ million users.
- An innovative forum for testing out new ideas for sharing our resources in publications, exhibitions, interpretation programs, and educational activities integrating text, graphics, audio, and video.
- A showcase for our staff expertise in "Ask the Experts" columns, online magazines, and online chat sessions.
- A virtual visitors center for sharing practical information on our cultural resources with tourists.
- An opportunity to use our cultural collections and resources to leverage funding for digitization and outreach projects via digital vendors, corporations, and foundations.
- A powerful antidote to professional isolation in remote areas as the Web allows us to network with our professional colleagues and friends regardless of how distant they may be.
- A speedy way to maintain, share, and update policies, procedures, and training

in a single searchable place at minimal cost.
- A superior desktop research tool allowing access to digital information including databases made or held by libraries, archives, museums, and other cultural resource repositories and organizations internationally.
- A powerful broadcast studio for sharing information on our events, activities, and programs.
- A web of informational resources uniting cultural resources professionals internationally through both planned searches and serendipitous browsing via hypertext links.
- A place to sell products and request donations via cooperating associations in order to make cultural resources more self-supporting.
- A democratic assemblage of information that requires basic training before mastery is possible.
- The world's most powerful printshop for telling our stories and sharing our mission, history, and vocation with an international audience.
- The "killer application" that provides a common entry point to all other features of the Internet.

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Henry C. Kelly

Government
Information Policy

The communication tools provided by contemporary technology provide convenient, practical, inexpensive access to people and information resources worldwide. Anyone with an inexpensive home computer willing to spend $10 a month can sit at home and look at pictures

taken by the Hubble telescope almost as soon as the NASA scientists in charge of the project.

Interested citizens can look at government press releases, proposed legislation, and other documents the instant they are released. Online browsers can now participate in discussion groups that span the globe, search through digital

libraries, and explore archival photographic and sound recordings ranging from classics to amateur productions. While full motion video on demand is now expensive, intense competition to deliver entertainment products to homes is likely to make even this service available to most Americans by the end of the decade.

These tools are already transforming the way Americans do business. Networked information and online tools are making standard transactions more efficient and providing opportunities to do things that were simply not considered possible-and certainly not affordable-using earlier technologies. Businesses can advertise and sell products through the World Wide Web. Hospitals can send CAT-scans through the net to get expert consultations from distant specialists. Students and scholars can avoid the cost and inconvenience of traveling around the world searching for text or multimedia materials and search enormous archives, located around the world, without leaving their studies.

Perspective on What's New

Networked information is just the tip of the iceberg-the easy part where the artifacts of earlier communications technology \(such as prints, photos, recordings) are digitized and transferred to computer archives. Modern information technology clearly also offers something qualitatively different-a unique ability to create synthetic environments. These environments permit an entirely novel form of communication. Instead of seeing a photograph of an old airplane, for example, a complete three-dimensional representation of the plane can be constructed in the computer so that it can be turned and examined from all sides. Moreover, simulations permit you to enter the plane and fly it over terrain as historically accurate as archival records permit.

Similarly, completely rendered ecologies can be simulated based on archival documentation. These ecologies can be explored by individuals or groups working together in the same simulated environment. The individuals joined in the exploration need not be in the same physical place. The individual participants can cooperate only in

the same virtual space seen on their computer screens. These environments can convey information just as it would be explained if an infinitely patient expert led you on a field expedition or the way an experienced manager would apprentice new staff members so that they could learn the intricacies of a business.

Computer simulations, of course, allow risks real expeditions wouldn't allow and permit explorations only possible through imagination-exploring lost cities, the miniature internal worlds of cells, or enormous worlds in outer space. These advanced, interactive, multi-dimensional systems convey information and ideas in ways that are

Welcome to the White House

An Interactive Citizens' Handbook

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The First Family

Tours

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easy to grasp, and in ways that make it easy to bridge the gap to more formal representations of information in words and numbers.

The Administration's Broad National Information Strategy

While it's impossible to predict the impact of these powerful new tools with any precision, there can be little doubt that mastery of the power of information technology will be essential to the U.S. economy in decades ahead. It also is likely that these new tools can be used to achieve real gains in areas ranging from health care, to entertainment, education, public health and safety.

Recognizing this, the Administration has an ambitious program designed to ensure that as many Americans as possible are able to take advantage of new information technologies as rapidly as possible. Since it's obvious that virtually

all of the work and investment will be done without federal direction or funds, the strategy has the following basic elements:

1. Ensuring that the laws and regulations governing communications encourage private investment and create a competitive environment with inter-operable systems-an environment needed both to stimulate innovation and to prevent the emergence of monopolies. The e Administration has been working with the Congress to design legislation that will achieve these objectives. It has been working with a variety of standards, organizations, and business groups to promote seamless interoperability between systems, to ensure the privacy of communications without compromising critical law-enforcement responsibilities, and to ensure the protection of intellectual property.

2. Ensuring the widest possible access to new technologies both by protecting universal access to phone, broadcast, and some advanced services in a modernized telecommunications market and by providing funds for connecting schools and libraries to advanced services. Universal service is a key part of the Administration's proposals for telecommunication reform—including provisions providing affordable links to classrooms. The Department of Commerce's Telecommunications and Information Infrastructure Program provides matching funds for schools, libraries, rural health care providers, economic development agencies, and state and local governments with innovative proposals for using telecommunication services.

3. Supporting research in areas key to widespread use of advanced information services where private funds are not available either because the risks are too great or the benefits to the nation far outweigh the benefits that any individual firm could capture. This has meant investing in key areas of advanced computer and communication technology (such as the six gigabit test networks being conducted in partnership with major telecommunication firms) and key systems issues relevant to the construction and evaluation of advanced education and training technology.

    The user-friendly, graphic interfaces now enjoying explosive market growth under names like Mosaic and Netscape resulted directly from federal software development funding. Federal research is also funding work in specific applications including health care (medical record management, digital transfer of X-rays, and other images), education and training, intelligent transportation management (traffic signals, air traffic control), and a host of other areas.

4. Providing convenient, efficient access to government information. The new communications technologies can make government operations and government information much more accessible, more timely, and more personal to citizens. They can also make it much easier to ask questions and receive responses that are timely, accurate, and tailored to individual interests and needs.

    These technologies can range in function from providing timely information on environmental regulations to efficient methods of filing state and federal income taxes.

    The information systems can also provide important tools for improving the productivity of government operations, making it easier to coordinate complex projects and keep the paperwork to a minimum.

5. Ensuring that worldwide communication services are inter-operable with domestic systems. The advantages of the new communication systems clearly don't stop on America's borders. U.S. businesses, research teams, students, and ordinary citizens clearly benefit when they are able to use the Internet to reach archives in Italy as easily as archives in Nebraska.

The administration is working with a number of international organizations to encourage all nations to achieve universal acceptance of the principles needed to build an efficient global information infrastructure that incorporates competitive, private, inter-operable systems. The effort has met with surprising success in spite of the fact that many nations began the decade with their communications systems completely controlled by state monopolies.

Government Information

Clearly the federal government's central role in accelerating the development and use of advanced information technologies is ensuring a regulatory environment that encourages innovation and competition. At the same time, the government must provide the public with protection against monopoly abuse and ensure universal access to basic services. But the government has other crucial responsibilities-perhaps the most obvious of which is to make the best possible use

of the new technology to make its own operations more efficient, more open, and more comprehensible.

The federal government is too often seen as a distant, hostile power operating without concern for the needs of individual citizens. The Clinton administration began with a commitment to make every possible use of new information technology to do the following:

- Streamline government operations
- Reduce paperwork
- Make government operations more open, responsive, and transparent
- Drastically cut the paperwork and forms required to deal with the government

Technology clearly can't solve all of the problems caused by obsolete government management practices. Technology can provide key tools for achieving federal goals quickly and at an acceptable cost. Private firms have found that information technology can only lead to real productivity gains when it is used as an integral part of broad management reforms. The Vice President's "reinvention taskforce" has done just this. It has been issuing a stream of dramatic management changes aimed at making government more responsive to its ultimate customers-the citizens it is supposed to serve. Information technology plays an important role in many of these reforms.

Dramatic gains in the performance of a large system like the federal government require making investments and taking some risks before savings can be realized. This is obviously difficult in a time of extreme fiscal stringency. Many agencies are faced with the problem of maintaining an increasingly expensive system for handling public requests and inquiries while finding the funds to invest in modern information systems that will eventually make their operations much more efficient and less costly. The Administration feels that it has developed a balanced approach which can ensure adequate investment in new systems while still cutting the overall cost of government. But its plans are vulnerable to budget cuts from the Congress.

Federal efforts to use information have taken three basic forms:

1. Providing convenient and easy-to-use tools for searching through the maze of government information and locating what you want when you want it.
2. Making raw data available in digital form so that it can be stored, searched, and transmitted by the new systems.
3. Providing a convenient way for citizens to communicate with the government-both sending forms to the government and

receiving individualized data from the government.

Navigating within the Federal Information Infrastructure

The White House Home Page is centerpiece of the federal government's efforts to make information available. This World Wide Web page (http://www.whitehouse.gov) provides a single point of entry to the federal digital world. Supplemented by the FedWorld collections maintained by National Telecommunications and Information Service (URL: http://www.Fedworld.gov) the White House Home Page leads systematically to federal information-every thing from agency press releases to genome sequences in NIH. The basic page is being upgraded to provide more convenient searching tools for the majority of us who may not have known to look for the Weather Bureau inside the National Oceanic and Atmospheric Administration (NOAA) inside of the Department of Commerce.

In addition, a series of specialized entry points has been developed for users with clearly identified interests. The U.S. Department of Agriculture, for example, provides a convenient point of entry for users familiar with its extension service programs. The Vice President's National Performance Review team has worked with the Small Business Administration and the Department of Commerce to introduce a U.S. Business Advisor page (URL: http://www.far.npr.gov.VDOTS) providing a format convenient for small businesses interested in finding practical information on regulations, Small Business Innovation Research programs, and other topics.

Creating Digital Records

While much of the information generated by the federal government is produced on computers-including the word processor used to create this manuscript-only a fraction of this information is available online. There are several reasons for this. Some are simple to remedy and others much less tractable.

Problems resulting simply from inertia or lack of understanding on the part of public officials are real but are being quickly remedied. The more serious problem is finding the funds needed to purchase and maintain the computer and communication equipment needed to make the information available, to periodically refresh the data, and to reformat it as the communications, software, and hardware systems change. In most cases it should be much less expensive for the government to initially make information available in electronic form than it is to make it available through conventional means, such as printing documents or answering phones.

Agencies find it difficult to justify investments in new computer systems while they maintain parallel, older systems to serve people lacking access to computer communications. The problem is compounded because many agencies must fund data dissemination by selling their publications. Shifting to free electronic dissemination would dry up the only source of funds available for making information available in any form. There is an old debate about whether the economy as a whole benefits if the federal government charges citizens for information which they could use to improve the performance of their businesses or make them better citizens. The new technology has forced the issue into the spotlight at a time when funding for any new programs-however cost effective-is difficult to obtain.

In spite of these problems, the administration has aggressively encouraged agencies to make material available in digital form. The efforts have met with a considerable amount of success-particularly in agencies familiar with the new technologies. A search of the federal digital holdings will, for example, lead to the following: (begin at URL:http://www.whitehouse.gov).

- Extensive collections of National Agricultural Statistics maintained by USDA including the National Spatial Data Infrastructure database in the Soil Conservation Service
- Collections of unclassified satellite photographs from the CIA
- An enormous variety of real time and historical weather data and weather satellite imagery from NOAA as well as extensive environmental data and information on geographic, atmospheric, and oceanographic information
- Extensive collections of press releases, regulatory notices, and announcements from most federal agencies
- Educational statistics from the Department of Education
- Seven million references and abstracts in the National Library of Medicine
- GRATEFUL MED software providing inexpensive access to the Library's collection of medical and health science information
- The National Park Service's descriptions of the 360+ national parks, including overviews of trails, camping, weather, site highlights, and peak tourism; as well as overviews of all NPS programs from curation to the Historic American Buildings Survey (http://www.nps.gov)

The funding problem is compounded when the information is not available in digital form. This is true particularly for archival information where documents are available only as ink on paper, microfilm, original photographs, motion pictures, sound recordings, and other document types captured using older technologies. The cost of digitizing this information can be very high, though the actual life of each generation of digital copy may be shorter than that of the original document. Digital data can be copied to new storage technologies at a comparatively low cost.

The bulk of the reformatting cost is associated with moving original rare materials from age and ensuring that they are properly handled, described, and made available. Materials with unclear copyright status may also require some legal research. It would be extremely useful to provide digital representations of archival and museum materials, such as photographs, sculptures, or technology of historic interest.

The most attractive digital format for archival and museum materials would be one in which the digitized image could be manipulated-or even disassembled-as a part of an interactive virtual environment. The cost of creating such representations is now well beyond the reach of agencies with federal collections. Technology costs change rapidly however.

It is unlikely that much archival information on cultural collections will be transferred to digital form using today's tight federal budgets. Instead, cultural resource managers must develop innovative funding approaches including foundation funding, partnerships, and cooperative agreements with business and academia.

To be successful, these innovative approaches must take advantage of the enormous resource represented by federal archivists, curators, historians, and other staff. These cultural resource managers are familiar with the significance of the digitized collections. Cultural resource managers provide significant "value added" services when they share their knowledge and expertise about the digitized collections with the public via the new information technologies.

Communicating with the Government

Effective use of new information systems means much more than simply making information available in raw form on a modern communication network. The effectiveness of the system depends on an ability to reduce the transaction costs people experience when dealing with the government. In particular, this means getting clear, timely answers to questions and minimizing the paperwork and hassle involved in responding to federal requests for information.

We hope that the networks being put in place will lead to a great improvement in systems which now depend largely on phone-answering

—**Kelly,** *continued on back page*

and paper-mailing. Several additional steps are being taken to simplify transactions with the federal government.

- A system will shortly be in place which will allow businesses to transmit their annual wage reports to the IRS electronically, greatly reducing the paperwork associated with annual wage reports.
- The President has ordered all agencies to accept all data submissions in electronic form. Work is underway to find an acceptable way to validate submissions with an electronic signature and to protect sensitive private information.
- Experiments are underway that will allow a wide range of public benefits to be distributed electronically through automated teller machines and point-of-sale retail terminals vastly reducing paperwork and reducing fraud.

Clearly this is just the beginning, transactions ranging from national park camping reservations to Medicare claims are likely to be conducted through the Internet in the near future leading to major productivity gains in government as well as vastly improved service.

Epilogue

Technology is producing a dramatic change in the way we communicate with each other and with the reservoir of ideas that we've inherited. Such a profound change in such a fundamental part of the human experience is likely to reshape the way the world works and lead to major leaps in the productivity of all forms of organizations-including public organizations.

Unlike the productivity gains of the industrial revolution, these gains can be made while increasing the way products and services are tailored to the interests and needs of individuals. They can increase the real choices and real power available to individuals as well as introducing new opportunities for collective activities.

The Administration is doing everything it can to ensure that Americans benefit from the revolution and avoid the dangers inherent in rapid change. We're certainly intent on seeing that the federal government is more responsive and "user friendly."

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